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A new species of *Pseudogonia* Brauer & Bergenstamm from Sardinia, and a key to the West Palaearctic species (Diptera: Tachinidae)

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Abstract

A new species of *Pseudogonia* (*P. metallaria* **n. sp.**) from south-west Sardinia (Italy) is described and illustrated. It is related to *P. parisiaca* (Robineau-Desvoidy, 1851) and *P. valens* (Richter, 1974). Its position in the genus is discussed. A revised key to West Palaearctic *Pseudogonia* is presented.
Keywords: Tachinidae, taxonomy, *Pseudogonia*, new species, Sardinia, Italy, identification key.

Zusammenfassung

Eine neue Art von *Pseudogonia* (*P. metallaria* **n. sp**) aus Süd-West-Sardinien (Italien) wird beschrieben und illustriert. Sie ist verwandt mit *P. parisiaca* (Robineau-Desvoidy, 1851) und *P. valens* (Richter, 1974). Ihre Stellung innerhalb der Gattung wird diskutiert. Ein überarbeiteter Bestimmungsschlüssel für die westpaläarktischen *Pseudogonia* wird vorgestellt.

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1 Introduction

Pseudogonia Brauer & Bergenstamm, 1889 is a genus found in the Afrotropical, Palaearctic, Oriental and Australian regions (Crosskey 1973, 1976, 1980; Herting 1984), belonging to the large and multiform tribe Goniini (sensu Herting 1984;

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WOOD 1987) which is characterised by completely incubated microtype eggs that hatch, only after having been swallowed, inside the host's mesenteron (WOOD 1987).

Up until now, six species of the genus *Pseudogonia* were known: *P. fasciata* (Wiedemann, 1819), an Afrotropical species that reaches also the Canary Islands (CROSSKEY 1980; HERTING 1984) and Spain (TSCHORSNIG et al. 1997); *P. madascariensis* Villeneuve, 1915 from Madagascar (CROSSKEY 1980); *P. parisiaca* (Robineau-Desvoidy, 1851), a Palaearctic species, widespread in central-southern Europe (reaching southwards to Corsica and Sicily), Central Asia and southern Siberia (HERTING 1984); *P. rufifrons* (Wiedemann, 1830), a subcosmopolitan species found in the Afrotropical, Palaearctic, Oriental and Australian regions (CROSSKEY 1973, 1976, 1980; HERTING 1984; CHAO 1999); *P. suspecta* Villeneuve, 1915 from Madagascar (?) (CROSSKEY 1980); *P. valens* (Richter, 1974), from Mongolia and Chita (southern Siberia) (RICHTER 1974, 1980; HERTING 1984). In the present paper a new species of *Pseudogonia* from south-west Sardinia is described.

Data on the biology are available only for *P. parisiaca*, an oligophagous parasite of Arctiidae (Lepidoptera), and for *P. rufifrons*, also oligophagous, but of Noctuidae (Lepidoptera) (cf. HERTING 1960; CROSSKEY 1976; TSCHORSNIG & HERTING 1994).

Acronyms

CNBF	Centro Nazionale per lo Studio e la Conservazione della Biodiversità Forestale – Corpo Forestale dello Stato (Verona, Italy)
CNC	Canadian National Collection (Ottawa, Canada)
MZUR	Museo di Zoologia, Università di Roma "La Sapienza" (Roma, Italy)
PC	Collection of P. CERRETTI (Verona, Italy)
SMNS	Staatliches Museum für Naturkunde (Stuttgart, Germany).

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2 Methods

The dissection of the male terminalia was done following the method described in detail by O'HARA (2002). The dissected male terminalia are preserved in glycerol in a small plastic tube and pinned together with the specimen. The illustrations were done using a Leica DMLS optic microscope (terminalia) and a Leica MZ 7.5 stereoscopic microscope (head). The photographs of the abdomen and the measurements were done using Leica IM 1000.

Terminology of the external morphology (other than male terminalia) follows MERZ & HAENNI (2000), except for antenna that follows STUCKENBERG (1999), that of male terminalia follows SINCLAIR (2000). Measurements and ratios of head follow TSCHORSNIG & RICHTER (1998).

3 Taxonomy

3.1 The *Pseudogonia parisiaca*-group

The *P. parisiaca* species-group includes three species (*P. parisiaca*, *P. valens* and *P. metallaria* n. sp.), which share a number of common characters and may form a monophyletic group:

- Head black in ground colour;
- ♂ with proclinate orbital setae (Figs. 1, 10);
- Second aristomere relatively short, 3–6 times as long as the third aristomere (Figs. 1, 2, 10);
- Setulae on parafacial shorter than frontal setae (Figs. 1, 10);
- Surstylus long, at least as long as $^1/_2$ of the syncercus (Figs. 4, 5) (Richter 1974: 404, figs. 5, 6).

3.2 *Pseudogonia metallaria* n. sp.

Material

Holotype ♂: Italy, Sardinia, Cagliari prov., Iglesiente, Domusnovas, Valle d'Oridda, ca. 300 m a. s. l. (N 39.41312, E 8.61295), 4.IX.2003, P. Cerretti, M. Tisato, D. Whitmore leg. [MZUR].

Paratypes: 1 ♀, ditto 4.IX.2003 [SMNS]; 1 ♂, ditto 5.IX.2003 [CNBF]; 2 ♀♀, ditto 5.IX.2003 [CNC, PC].

All the specimens were swept in the morning from flowers of *Euphorbia pithyusa cupanii* (Guss.) A. R. Sm. (Euphorbiaceae).

Etymology

From the Latin *metallaria*, meaning miner, in reference to the landscape in which the specimens were caught. The area is indeed deeply transformed by mining activities that, in the Iglesiente region, are of ancient origin, so much so that the word *metalla* (= mine), from which the adjective *metallaria* derives, was used by the ancient Romans in regard to the Sardinian mines.

Diagnosis

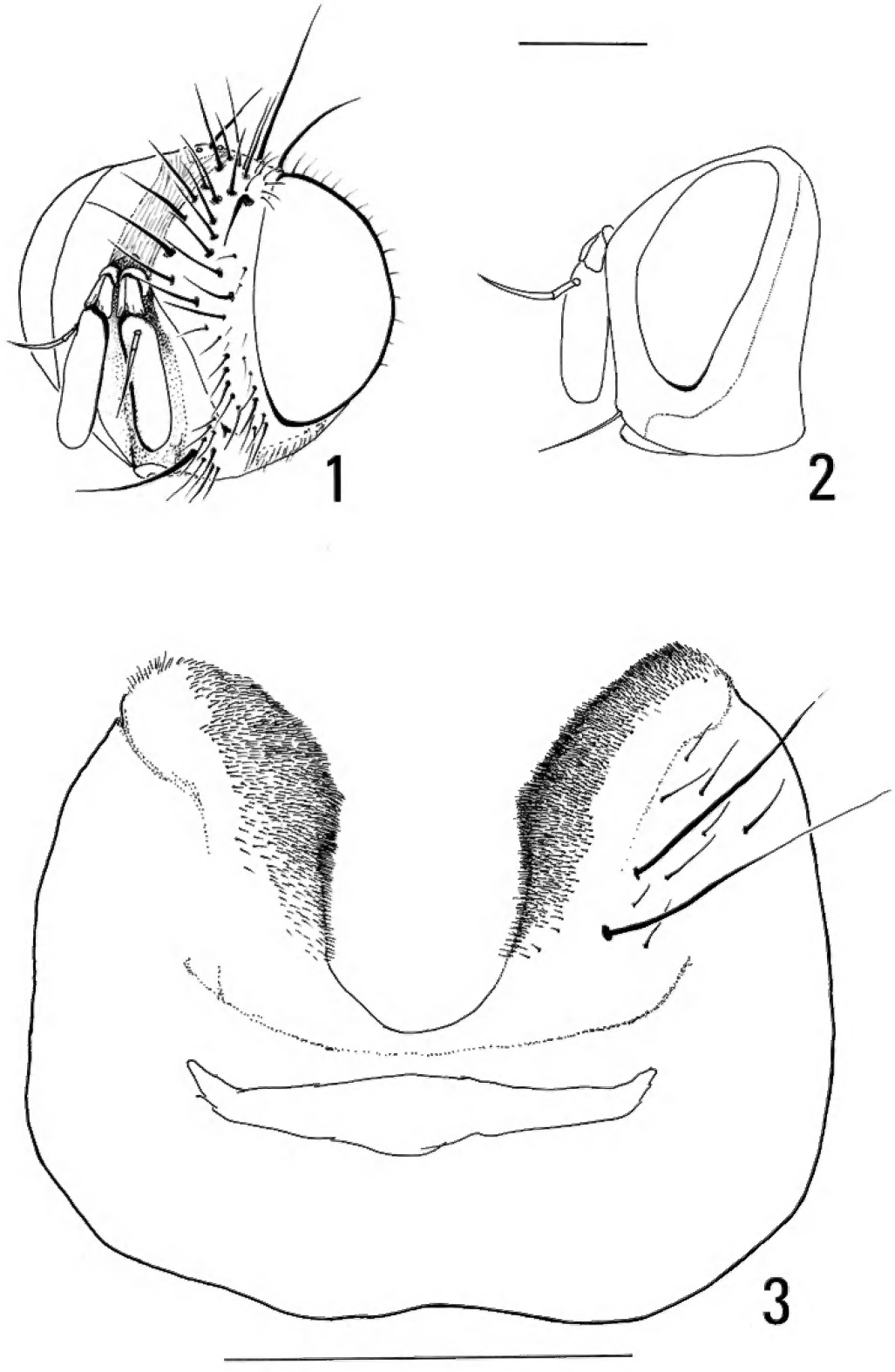
Head black with grey microtrichosity except on vertex and posterior half of fronto-orbital plate which is shiny black. Palpus black. Scutellum entirely black. Inner border of lower calypter black. ♂: Abdominal tergites 3 and 4 shiny black with a transverse basal band of weak microtrichosity on at most $^1/_2$ of the length of each segment; the bands are interrupted medio-dorsally showing a broad black longitudinal stripe on tergites 3 and 4; abdominal tergite 5 shiny black. ♀: Abdomen entirely shiny black.

Description

Male (measurements in square brackets refer to the holotype):

Length: 6.5-[7.5] mm.

Colour. Head black with grey microtrichosity except on vertex and posterior half of fronto-orbital plate which are shiny black; scape and pedicel dark brown, postpedicel black; palpus black. Thorax and legs black; scutum very weakly microtrichose; presutural area with four longitudinal dark vittae (the lateral pair sub-triangular); legs without microtrichosity. Lower calypter white with black inner margin;



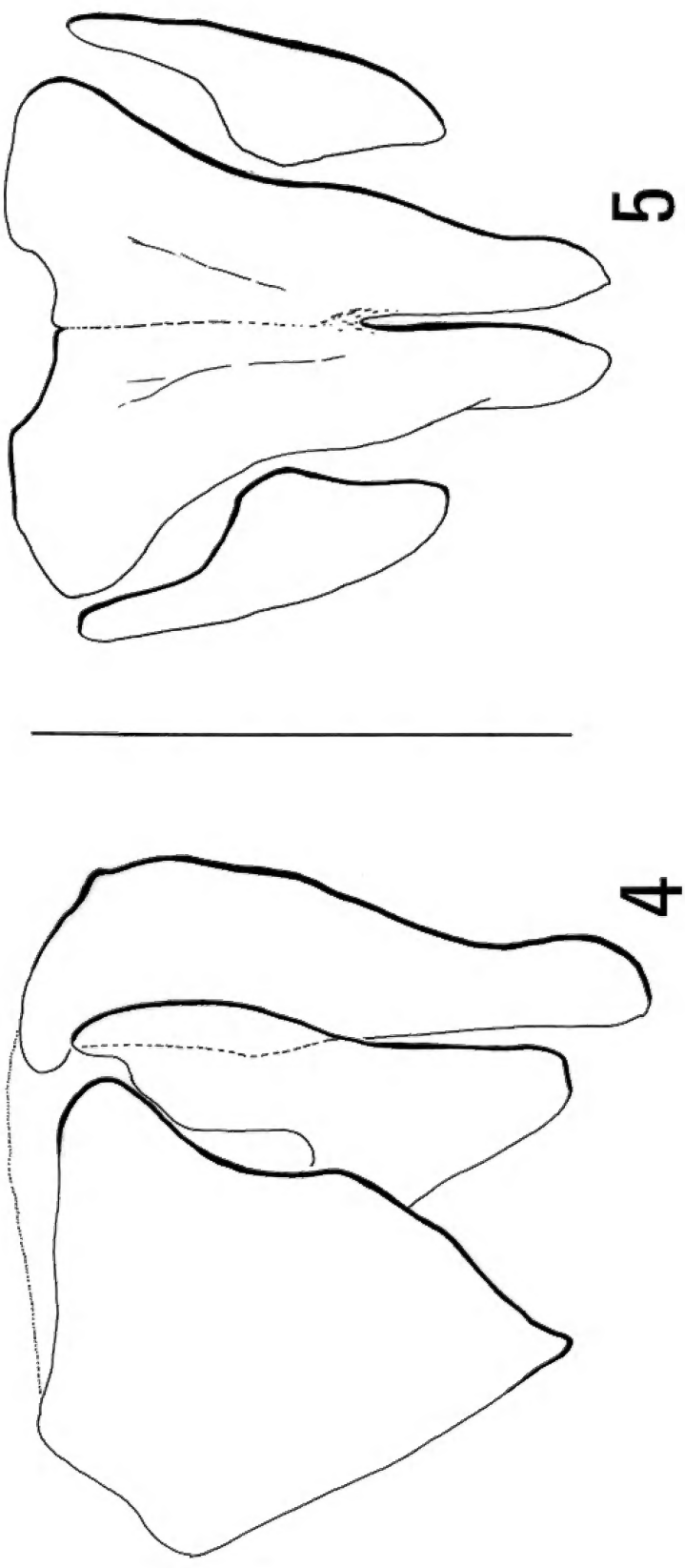
Figs. 1–3. *Pseudogonia metallaria* n. sp., ♂. – **1–2**. Head (holotype). **3**. Sternite 5 in ventral view (paratype). – Scales: 1 mm for Figs. 1–2, 0.5 mm for Fig. 3.

upper calypter white. Wing hyaline; tegula and basicosta black, veins black or dark brown. Abdomen (Fig. 16) black; tergite 3 with a transverse band of very weak microtrichosity on anterior $^1/_4$–$^1/_3$ dorsally; tergite 4 with a transverse band of weak microtrichosity on anterior $^1/_2$; tergite 5 shiny black without microtrichosity. The transverse bands of microtrichosity on abdominal tergites 3 and 4 are interrupted medio-dorsally showing a broad longitudinal black stripe. Terminalia black.

Head (Figs. 1, 2). Eye bare. Arista bare, thickened nearly to apex. First aristomere as long as wide; second aristomere about 4–6 times as long as its diameter, 0.3–[0.6] times as long as third aristomere. Postpedicel about [3.4]–4.1 times as long as pedicel. Frons at its narrowest point [1.4]–1.5 times as wide as an eye in dorsal view. Ocellar setae well developed, reclinate or lateroclinate. Medial vertical setae strong, reclinate, sub-parallel (from each other). Lateral vertical setae well developed, lateroclinate. 1–3 reclinate, or lateroclinate, upper orbital setae; 1 proclinate orbital seta. 7–9 frontal setae descending to the level of the base of the arista or slightly lower. Fronto-orbital plate with one row of strong medioclinate setae lateral to the row of frontal setae. Parafacial with two rows of setae. Parafacial (in lateral view) at its narrowest point [0.6]–0.7 times as wide as the postpedicel. Face not visible in lateral view. Lower facial margin well visible in lateral view. Vibrissa well developed, arising above level of lower facial margin. Facial ridge with decumbent setulae on lower $^1/_5$–$^1/_4$. Genal dilation well developed. Gena in profile about 0.25 [0.24] times the vertical height of eye (height measured in the same vertical plane as height of head). Postocular setae short, slightly bent forwards. Occiput flat, with white hair-like setulae, without black setulae behind the postocular row. Prementum about 5–7 times as long as wide. Palpus slightly clavate with some setulae ventrally, dorsally and apically.

Thorax. Prosternum with some robust setulae on its lateral margin. Postpronotum with 3 setae arranged in a straight line. Scutum with 3+3 acrostichal, 3+4 dorsocentral, 1+3 intraalar, 2 posthumeral, 1 presutural, 2 notopleural, and 3 supraalar setae (first postsutural supraalar seta longer than notopleural setae), postalar callus with 3 setae. Anatergite bare. Proepisternum bare. Proepimeron with 3–4 strong setae and 8–10 long setulae. Katepisternum with 4 setae; ventrolateral surface of katepisternum with several fine setulae. One anepimeral seta. Anepimeron with hair-like setulae on posterior half. Anepisternum with 5–7 setae. Katepimeron bare. Meral setae present. Scutellum with 1 pair of erected preapical setae slightly divergent (from each other), 1 pair of parallel or divergent apical setae (as in *P. parisiaca*), 1 pair of subapical, 1 pair of lateral, and 1 pair of basal setae. Subscutellum well developed, strongly convex. Postmetacoxal area membranous.

Legs. Fore leg: Coxa with bare medial surface and with several long setae in dorsal, anterodorsal and posterodorsal position; femur with more or less regular rows of long dorsal, posterodorsal, anteroventral, and posteroventral setae; tibia with regular rows of anterodorsal and posterodorsal setae, and 2 posterior setae; preapical anterodorsal seta shorter than preapical dorsal seta; claws longer than tarsomere 5. – Mid leg: Coxa with a row of strong setae in anterodorsal and anterodistal position; femur with rows of (in number, length and thickness) very irregular anteroventral and posteroventral setae, 2–3 anterior setae and 1–3 posterior preapical setae; tibia with 3–4 anterodorsal setae, a row of posterodorsal setae, 2 posterior setae, 1 ventral seta; claws about as long as tarsomere 5 or slightly shorter. – Hind leg: Coxa with a row of setae on anterodorsal and anterodistal margin, posterior coxal margin bare;



Figs. 4–5. *Psendogonia metallaria* n. sp., male terminalia (paratype). – **4**. Epandrium, surstyli and cerci in lateral view. **5**. Same in posterior view. – Scale: 0.5 mm.

femur with irregular rows of anterodorsal, anteroventral and posteroventral setae; tibia with a regular row of anterodorsal setae with, almost halfway, a seta about 1.5 times as long as the others, and an irregular row of posterodorsal setae, 2–3 anteroventral setae, 3 dorsal preapical setae, posteroventral preapical seta shorter than anteroventral preapical seta; claws about 0.9 times as long as tarsomere 5.

Wing. Costal spine slightly longer than the costal setulae. Second costal portion (CS_2) ventrally bare. Base of R_{4+5} with 3–4 setulae. Section of M between crossveins R-M and DM-Cu 2.3–2.5 times as long as section between DM-Cu and bend of M. Bend of M nearly at a right angle or slightly obtuse, rarely with a short stub. Crossvein DM-Cu not exceptionally oblique. Wing cell r_{4+5} open.

Abdomen (Fig. 16). Tergites not fused. Ventral edges of tergites 2, 3 and 4 almost entirely overlapping the corresponding sternites. Middorsal depression on abdominal syntergite 1+2 extending posteriorly to hind margin of that segment. Syntergite 1+2 with 1 pair of long median marginal setae, 1 pair of lateral marginal setae; general setulae decumbent. Tergite 3 with 1 pair of median marginal setae; 1 or 2 pairs of lateral marginal setae. Tergite 4 with a row of 15–20 marginal setae. Tergite 5 with a row of marginal setae and several long and robust discal setae.

Terminalia (Figs. 3, 4, 5). Hind margin of sternite 5 with a deep cleft; lateral lobe large; medio-apical margin of lateral lobe with dense microtrichia; transversal membranous stripe present. Tergite 6 divided in two hemitergites, joining segment 7+8 by a membrane; tergite 6 and membrane bare; spiracle 6 situated on membrane. Sternite 6 well developed and asymmetrical, articulated to segment 7+8 on its left side, and attached to it by a membrane on its right side. Sternite 6 and segment 7+8 bare. Epandrium short and convex. Cerci broad, with a dorso-medial suture, apically separated from each other. Surstyli shorter than cerci, sub-triangular in lateral view, with several setulae latero-apically. Bacilliform sclerites long. Medial plate of hypandrium sub-rectangular in dorsal view; hypandrial arms joining postero-medially forming a bridge-like structure. Pregonite and postgonite rounded apically and bent anteriorly. Basiphallus with a posterior basal extension. Epiphallus not differentiated. Distiphallus joining basiphallus by a dorsal sclerite and by a ventro-lateral membrane; lateroventral surface of distiphallus strongly sclerotized and covered with scale-like spinules.

Female, differs from male as follows:

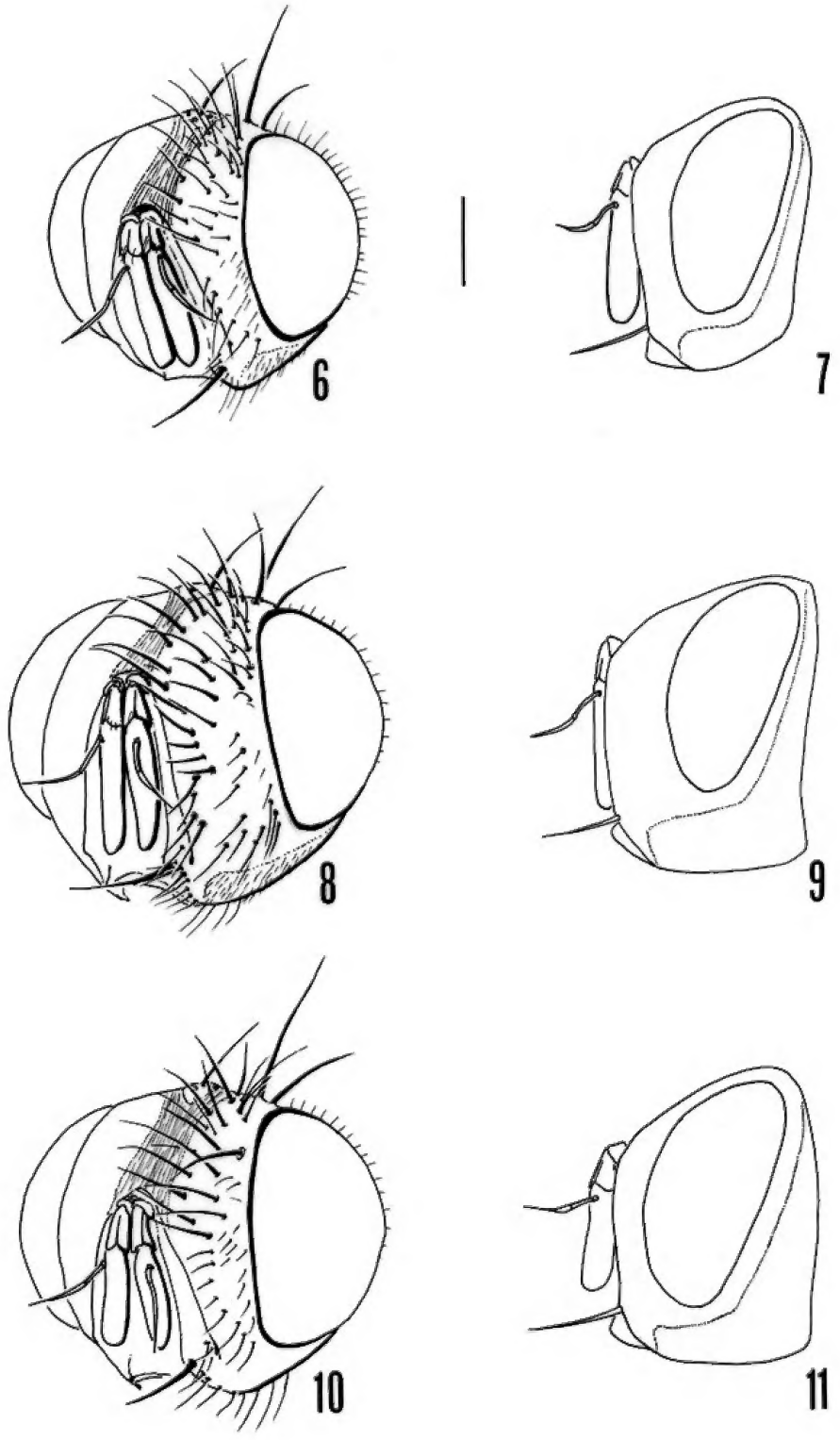
Length: 7.1–8.7 mm.

Colour: Abdomen entirely shiny black without microtrichosity (Fig. 17).

Head: Postpedicel 2.1–2.5 times as long as pedicel. Frons at its narrowest point 1.4–1.6 times as wide as an eye in dorsal view. Parafacial (in lateral view) at its narrowest point 0.9–1.3 times as wide as the postpedicel. Gena in profile 0.3–0.4 times the vertical height of eye.

3.3 Comparative notes

As mentioned in chapter 3.1, *Pseudogonia metallaria* n. sp. is probably closely related to *P. parisiaca* and *P. valens*, the other two species known only from the Palaearctic Region. *P. metallaria* n. sp. is clearly different from *P. parisiaca*, as shown in the following key, and from *P. valens*, which is a large species (11.5–13.5 mm) with microtrichose fronto-orbital plate and vertex, yellow or red palpus and scutellum,



Figs. 6–11. *Pseudogonia* spp., head of ♂. – **6–7**. *P. rufifrons* (Sicily). **8–9**. *P. fasciata* (Tenerife, Canary Islands). **10–11**. *P. parisiaca* (Latium). – Scale: 1 mm.

uninterrupted dorsal anterior bands of microtrichosity on the abdomen of the female, and lacking the parallel apical setae of the scutellum (RICHTER 1974; TSCHORSNIG pers. comm.).

3.4 Key to the West Palaearctic species

This key is based on features taken from MESNIL (1956: 532–538, as *Isomera* Robineau-Desvoidy, 1851), TSCHORSNIG & HERTING (1994: 63), RICHTER (1974), TSCHORSNIG (pers. comm.), and CERRETTI (unpublished).

1 Setae on parafacial as long as frontal setae (Figs. 6, 8). Scutellum without apical setae. Second aristomere 0.6–1.1 times as long as third aristomere (Figs. 6–9). Vertex yellowish or reddish in ground colour. Hind tibia with 2 or 3 dorsal preapical setae. Male without proclinate orbital setae **2**

– Setae on parafacial shorter than frontal setae (Figs. 1, 10). Scutellum with one pair of short and weak apical setae, usually parallel or divergent, rarely convergent. Second aristomere 0.2–0.6 times as long as third aristomere (Figs. 2, 11). Vertex black or dark-brown. Hind tibia with 3 dorsal preapical setae. Male with 1–3 proclinate orbital setae **3**

2 Parafacial at its narrowest point about half (or less) as wide as face (measured at its widest point in frontal view) (Fig. 6); head shape as in Fig. 7. Prementum about 4–6 times as long as wide. Anterior row of setulae on parafacial well differentiated from the posterior row (Fig. 6). Abdominal tergites 3–5 microtrichose on anterior $^2/_3$–$^5/_6$ of each segment, showing shifting spots (Fig. 12). Hind tibia usually with 2 dorsal preapical setae. .... ***P. rufifrons*** (Wiedemann)

– Parafacial at its narrowest point about as wide as face (measured at its widest point in frontal view) (Fig. 8); head shape as in Fig. 9. Prementum very long, about 8 times as long as wide. Anterior row of setulae on parafacial not so differentiated from the posterior row. Abdominal tergites 3–5 each with a transverse band of light grey, dense microtrichosity on anterior $^1/_3$–$^1/_2$ (Fig. 13). Hind tibia with 3 dorsal preapical setae. ***P. fasciata*** (Wiedemann)

3 Fronto-orbital plate and vertex covered with grey microtrichosity. Palpus yellowish or red. Scape and pedicel nearly always yellow or red. Inner margin of lower calypter white, yellowish or red. Scutellum at least apically red; scutum and scutellum covered with usually dense grey microtrichosity. ♂ (Fig. 14): Abdominal tergites 3–5 with transverse anterior bands of dense microtrichosity: $^1/_3$–$^2/_3$ dorsally on tergite 3 (less ventrally), $^2/_3$ or more dorsally on tergites 4 and 5 (slightly less ventrally); a very narrow dorsal dark longitudinal stripe on the abdomen may or may not be present (its width being at most $^1/_3$ of the distance between the median marginal setae of tergite 3). ♀ (Fig. 15): Abdominal tergites 3 and 4 dorsally microtrichose on, at least, anterior $^1/_3$, slightly less ventrally; tergite 5 microtrichose at least lateroventrally: general aspect of abdomen not shiny black. – Body length 9.5–13 mm. ..... ***P. parisiaca*** (Robineau-Desvoidy)

– Vertex and posterior half of fronto-orbital plate shiny black. Palpus entirely black. Scape and pedicel dark brown or black. Inner margin of lower calypter black. Scutellum entirely black; scutum and scutellum very weakly microtrichose. ♂ (Fig. 16): Abdominal tergites 3 and 4 with a dorsal band of weak microtrichosity on at most anterior $^1/_2$, interrupted medio-dorsally, showing a broad longitudinal black stripe which is about as wide as the distance between the median marginal setae on tergite 3; tergite 5 entirely shiny black. ♀ (Fig. 17): Abdomen entirely shiny black. – Body length 6.5–9 mm. ..... ***P. metallaria*** **n. sp.**

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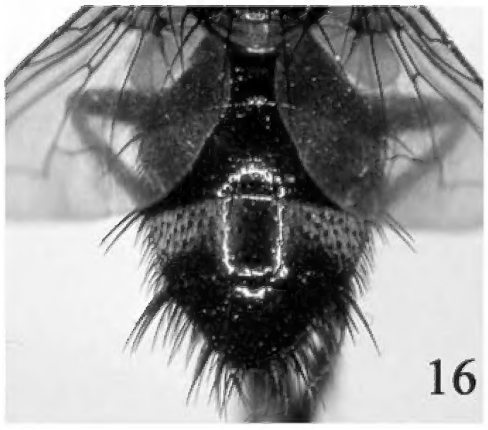

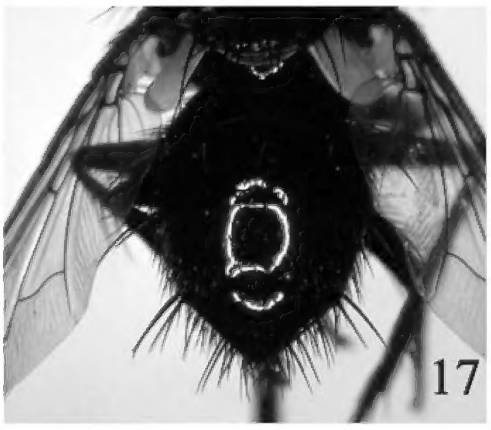

Figs. 12–17. *Pseudogonia* spp., abdomen in dorsal view. – **12**. *P. rufifrons*, ♂ (Sicily). **13**. *P. fasciata*, ♂ (Tenerife, Canary Islands). **14**. *P. parisiaca*, ♂. **15**. *P. parisiaca*, ♀ (Latium). **16**. *P. metallaria* n. sp., ♂ (holotype). **17**. *P. metallaria* n. sp., ♀ (paratype).

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